

IN THE CLAIMS

1 1 (currently amended) A method of routing a plurality of demands in a an optical
2 network that comprises nodes interconnected by links, each demand having two end
3 nodes, the method comprising:

4 a) logically subdividing the network into a plurality of rings, wherein each ring is
5 formed by two link-disjoint paths between a pair of nodes;

6 b) to each of the demands, assigning a ring that contains both of the pertinent end
7 nodes; and

8 c) to each of the demands, assigning two mutually link-disjoint paths on the ring
9 from one end node to the other, wherein one said path is a working path and the other
10 said path is a protection path.

1 2 (original) The method of claim 1, wherein each of the protection paths is node-
2 disjoint from its corresponding working path.

1 3 (original) The method of claim 1, further comprising, for at least one pair of
2 end nodes, subdividing a total demand between said end nodes into a plurality of unit
3 demands, and wherein the assigning of working paths and protection paths is performed
4 on the unit demands.

1 4 (currently amended) The method of claim 3, wherein ~~the network is an optical~~
2 ~~network~~, each link of the network comprises one or more optical fibers, and one unit of
3 demand is equivalent to the bandwidth capacity of one wavelength channel on an optical
4 fiber.

1 5 (original) The method of claim 1, wherein each working path and each
2 protection path is confined to a single ring.

1 6 (currently amended) The method of claim 1, wherein ~~the network is an optical~~
2 ~~network~~, and the method further comprises assigning at least one wavelength channel to

3 each working path and to each protection path, resulting in a working wavelength channel
4 on the working path and a protection wavelength channel on the protection path.

1 7 (original) The method of claim 6, wherein the assignment of wavelength
2 channels is carried out such that no two demands have the same working wavelength
3 channel or protection wavelength channel.

1 8 (original) The method of claim 6, wherein the path and wavelength-channel
2 assignments are carried out so as to drive down a cost function determined at least in part
3 by the occupancy of wavelength channels on links of the network.

1 9 (original) The method of claim 8, wherein the cost function is further
2 determined by the occupancy of ports or optical termination units at nodes of the
3 network.

1 10 (original) The method of claim 8, wherein:
2 the links of the network comprise optical fibers,
3 the cost function includes, for each link, a cost component for placing a further
4 wavelength channel on such link; and
5 said cost component is selected to decrease as the number of already-placed
6 wavelength channels increases, but to jump to a highest value when the number of
7 already-placed wavelength channels reaches the full capacity of one optical fiber.

1 11 (original) The method of claim 10, wherein the cost function further includes
2 a cost component for placing wavelength ports at end nodes of the link, and the cost
3 component is selected to decrease as the number of already-placed wavelength ports
4 increases, but to jump to a highest value when the number of already-placed wavelength
5 ports reaches the full capacity of one optical cross-connect.

1 12 (original) The method of claim 8, wherein the path and wavelength-channel
2 assignments are carried out such that the assignments to the respective demands jointly
3 drive down the cost function.

1 13 (currently amended) The method of claim 1, wherein ~~the network is an optical~~
2 ~~network~~, each link of the network comprises one or more optical fibers, and the method
3 further comprises assigning at least one wavelength channel to each working path and to
4 each protection path.

1 14 (currently amended) The method of claim 1, wherein ~~the network is an optical~~
2 ~~network~~, each link of the network comprises one or more optical fibers, and rings having
3 a common link are permitted to share optical fibers on such common link.

1 15 (currently amended) The method of claim 1, wherein:
2 ~~the network is an optical network~~, each link of the network comprises one or more
3 optical fibers;
4 the method further comprises assigning at least one wavelength channel to each
5 working path and to each protection path; and
6 the assignment of wavelength channels is carried out such that on a given ring, the
7 protection paths of two or more demands are permitted to share the same wavelength
8 channel if the respective working paths of said demands have no common link on the
9 given ring.

1 16 (original) The method of claim 15, wherein:
2 two or more rings having a common link are permitted to share optical fibers on
3 such a common link; and
4 each wavelength channel on such a shared optical fiber belongs exclusively to
5 only one of the sharing rings.

17 (original) The method of claim 16, wherein each optical fiber on a given link of a ring is allocated exclusively to one ring.

18 (original) The method of claim 15, wherein:

at least one of the demands routed in the network is a compound demand having a source node and a destination node and comprising two or more constituent demands each of which begins or ends on a node intermediate the source and destination nodes;

the assignment of rings to demands comprises assigning a ring to each of the constituent demands; and

a working path or protection path for the compound demand is permitted to pass through links occupied by distinct rings.

19 (original) The method of claim 18, wherein the subdividing of the network into rings comprises selecting a working path for each demand, and then defining a set of rings such that every link of the network that is occupied by a working path is also occupied by at least one ring.

20-24 (canceled)